REMARKS/ARGUMENTS

With this amendment, claims 15, 16, 26, and 27 are pending. Claims 6-14 and 17-21 are cancelled without prejudice to subsequent revival. For convenience, the Examiner's rejections are addressed in the order presented in a January 9, 2004 Office Action.

I. Status of the claims

Claim 15 is amended to recite that the antibody composition comprises an antibody that is specifically binds to a CD97 EGF-like repeat selected from the group consisting of SEQ ID NO:3 and SEQ ID NO:4. Support for antibodies specifically reactive to SEQ ID NO:3 or SEQ ID NO:4 is found throughout the specification, for example at page 23, lines 25-28. Claim 15 is also amended to define EGF as epidermal growth factor. These amendments add no new matter.

Claim 16 is amended to recite that the antibody composition comprises at least three different antibodies that bind to different soluble CD97 α subunit epitopes. Support for this amendment is found throughout the specification, for example, at page 20, lines 8-11, and at original claim 16. This amendment adds no new matter.

New claim 26 depends from claim 15 and is directed to an antibody composition that comprises an antibody that is specifically reactive to the CD97 EGF-like repeat of SEQ ID NO:3. New claim 27 also depends from claim 15 and is directed to an antibody composition that comprises an antibody that is specifically reactive to the CD97 EGF-like repeat of SEQ ID NO:4. Support for the new claims is found throughout the specification, for example at page 23, lines 25-28.

New claim 28 is added and recites that the α1 subunit has an EGF-like repeat selected from SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, and SEQ ID NO:5. Support for the composition of the α1 subunit is found throughout the specification, for example at page 22, lines 26-27. New claim 29 is added and that the α2 subunit has an EGF-like repeat selected from SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, and SEQ ID NO:5. Support for the

composition of the α2 subunit is found throughout the specification, for example at page 23, lines 2-3.

Claims 6-14 and 17-21 are cancelled without prejudice to subsequent revival.

II. Objections to the abstract

The specification is objected to because the abstract allegedly does not contain a concise statement of the technical disclosure of the patent. In order to expedite prosecution the abstract is amended to recite an antibody composition.

III. Rejections under 35 U.S.C. §112, first paragraph, enablement

Claims 15 and 16 are rejected under 35 U.S.C. §112, first paragraph as allegedly failing to enable one of skill to practice the claimed invention. The claims are now directed to an antibody composition that specifically binds to a soluble CD97 α subunit, *i.e.*, α1 or α2, and that include an antibody that specifically binds to a CD97 EGF-like repeat selected from SEQ ID NO:3 or SEQ ID NO:4. To the extent the rejection applies to the amended claims, Applicants respectfully traverse.

The appropriate test of enablement is "whether one skilled in the art could make or use the claimed invention from the disclosure in the patent coupled with information known in the art without undue experimentation" (*see, e.g.*, MPEP §2164.01). As described below, the specification as written provides ample direction in the form of assays and working examples to identify antibody compositions comprising antibodies that specifically bind to a CD97 EGF-like repeat selected from SEQ ID NO:3 or SEQ ID NO:4.

The specification teaches how to make antibodies that bind to specific sequences and their identification, *e.g.*, immunoassays. See, *e.g.*, specification at pages 36-47. The specification also teaches antibodies that specifically bind to CD97 α subunits at page 23, line 31 through page 24, line 2. Proteins and epitopes specifically identified as appropriate for antibody production in the specification include a CD97 α subunit. A CD97 α subunit is a CD97 sequence that is N-terminal to an RGD motif. The sequence N-terminal to the RGD motif of CD97 is identified in Figure 1. The α1 subunit is taught to comprise EGF-like repeats of SEQ ID NOs:1,

2, 3, 4, and 5 at page 22, lines 26-31. The α2 subunit is taught to comprise EGF-like repeats of SEQ ID NOs:1, 2, 3, and 5 at page 22, lines 26-31. Antibodies against individual EGF-like repeats of SEQ ID NOs:1, 2, 3, 4, and 5 are taught *e.g.*, at page 23, lines 25-28. In addition, an example of an antibody that binds to SEQ ID NO:3 is found, *e.g.*, at Example 3, page 75. Applicants note that SEQ ID NO:15 is a subsequence of SEQ ID NO:3 and that an antibody that recognizes SEQ ID NO:15 would recognize SEQ ID NO:3.

As amended, claim 16 depends from claim 15 and is directed to an antibody composition that comprises at least three different antibodies that bind to different soluble CD97 α subunit epitopes. As described above, the specification teaches how to make antibodies against individual EGF-like repeats of SEQ ID NOs:1, 2, 3, 4, and 5. The Office Action concurs that antibodies that bind to SEQ ID NOs:1, 2, and 5 are enabled. See, *e.g.*, Office Action at page 3. The specification also enables one of skill to make antibodies that bind to SEQ ID NO:3 or SEQ ID NO:4. Thus, claim 16 is enabled for an antibody composition that comprises at least three different antibodies that bind to different soluble CD97 α subunit epitopes, *e.g.*, SEQ ID NO:3 and/or SEQ ID NO:4 in combination with SEQ ID NOs:1, 3, or 5.

Based on the teachings of the specification the claims are enabled as required by 35 U.S.C §112, first paragraph. In view of the above amendments and remarks, withdrawal of the rejection is respectfully requested.

IV. Rejections under 35 U.S.C. §112, second paragraph

Claims 15 and 16 are rejected under 35 U.S.C. §112, second paragraph for alleged indefiniteness. To the extent the rejections apply to the amended claims, Applicants respectfully traverse and assert that one of ordinary skill in the art would understand the claimed invention in light of the specification. "[35 U.S.C.] §112, second paragraph, requires a determination of whether those skilled in the art would understand what is claimed in light of the specification." *Orthokinetics v. Safety Travel Chairs Inc.*, 1 USPQ2d 1081 (Fed. Cir. 1986). Moreover, Applicants properly provided their own definitions of phrases objected to by the Office Action and those definitions clarify the claims. "...[A] patentee can be his own lexicographer provided the patentee's definition, to the extent if differs from the conventional definition, is clearly set

forth in the specification." *Beachcombers v. Wildwood Creative Products, Inc.* 31 F.3d 1154, 1158 (Fed. Cir. 1994).

Specifically, claim 15 is rejected for use of the phrase "specifically reactive, under immunologically reactive conditions". Claim 15 is now amended to recite "specific binding", which is defined in the specification at page 18, line 25 through page 19, line 4.

Claim 15 is also rejected for use of the phrase "EGF-like". An "EGF-like repeat, is defined at page 11, lines 23-24 of the specification and "includes reference to at least one of the sequences selected from the group consisting of SEQ ID NOs: 1 through 5." Thus, the phrase EGF-like would be understood by one of skill in the art, based on the definition given in the specification.

Claim 15 is also rejected for use of the term "EGF". Claim 15 is now amended to use the full terminology, *i.e.*, epidermal growth factor, before the first citing of EGF in the claim.

Claim 16 is rejected for use of the term "unique". The Office Action asserts that unique is superfluous and does not further clarify the claimed subject matter. In order to expedite prosecution claim 16 is amended to recite three different antibodies that bind to different soluble CD97 α subunit epitopes. Support for this amendment is found throughout the specification, for example at page 20, lines 8-11.

In view of the above amendments and remarks, withdrawal of the rejection is respectfully requested.

V. Rejections under 35 U.S.C. §102(b)

Claim 15 is rejected under 35 U.S.C. §102(b) as allegedly anticipated by Hamann *et al.*, *J. Immun.* 155:1942-1950 (1995), (Hamann *et al.* (A)), and accession number P48960. According to the Office Action Hamann *et al.* (A) discloses four antibodies that react with the claimed EGF-like domains of the CD97 molecule. To the extent the rejection applies to the amended claims, Applicants respectfully traverse the rejection.

To anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found...in a single prior art reference." *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d

1051, 1053 (Fed. Cir. 1987). Thus, in order to anticipate, the cited references must contain every element of the claims at issue. The cited references do not.

The amended claims are directed to antibody compositions that bind to a soluble CD97 α subunit and comprise an antibody that specifically binds to a CD97 EGF-like repeat selected from SEQ ID NO:3 and SEQ ID NO:4. The largest CD97 amino acid sequence disclosed in the application has 835 amino acid residues and includes 5 EGF-like repeats, *i.e.*, SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, and SEQ ID NO:5. The claimed antibody compositions specifically bind to a CD97 α1 subunit or to a CD97 α2 subunit. The CD97 α1 subunit is disclosed to comprise SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, and SEQ ID NO:5; the CD97 α2 subunit is disclosed to comprise SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, and SEQ ID NO:5.

The cited references do not disclose either a CD97 EGF-like repeat of SEQ ID NO:3 or SEQ ID NO:4, and thus cannot teach antibodies that recognize those epitopes of the CD97 protein. Hamann *et al.* (A) discloses a CD97 protein with 742 amino acids and only three EGF-like repeats. See, *e.g.*, Figure 2 and caption at page 1945 of Hamann *et al.* (A). The sequence disclosed in Hamann *et al.* (A) does not disclose SEQ ID NO:3 or SEQ ID NO:4.

The Office Action also cited Accession number P48960 as allegedly anticipating the claimed invention. Applicants respectfully point out that the sequence disclosed in Accession number P48960 has been repeatedly revised since it was first deposited on June 1, 1996. The original sequence of P48960 was deposited by the authors of Hamann *et al.* (A) and discloses the same sequence as that reference. P48960 did not disclose the sequences of SEQ ID NO:3 and SEQ ID NO:4 until November 4, 1999, well after the priority date of this application, *i.e.*, October 25, 1996. As proof of this assertion, Applicants submit as Exhibit A, a revision history for P48960 and records for the accessible sequences of September 24, 1999 and November 4, 1999.

Because neither of the cited references disclose the amino acid sequence of SEQ ID NO:3 or SEQ ID NO:4, neither of the cited references can disclose antibodies that specifically bind to SEQ ID NO:3 or SEQ ID NO:4. Thus, the cited references do not disclose all the

elements of the claimed invention and are not properly cited as prior art. In view of the above amendments and remarks, withdrawal of the rejection is respectfully requested.

VI. Rejections under 35 U.S.C. §103(a)

Claim 15 is rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Hamann *et al.*, *Genomics* 32:144-147 (1996), (Hamann *et al.* (B)), and Accession number P48960 in view of Campbell. According to the Office Action, Hamann *et al.* (B) and Accession number P48960 teach the sequence of CD97 disclosed in the application and Campbell teaches a strategy to generate antibodies, allegedly making the generation of the claimed CD97 antibodies *prima facie* obvious in view of the combination of the references. To the extent the rejection applies to the amended claims, Applicants respectfully traverse the rejection.

To establish a *prima facie* case of obviousness, three basic criteria must be met: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference must teach or suggest all the claims limitations. MPEP§2143. See also *In re Rouffet,* 47 USPQ2d 1453. The court in *Rouffet* stated that "even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination." *Rouffet* at 1459.

The references cited by the Office Action do not teach or suggest all the limitations of the amended claims. As amended, the claims are directed to antibody compositions that bind to a soluble CD97 α subunit and comprise an antibody that specifically binds to a CD97 EGF-like repeat selected from SEQ ID NO:3 and SEQ ID NO:4. Applicants reiterate that the specification discloses the sequence of a CD97 protein with three, four, or five EGF domains and that the sequences of two of those domains, *e.g.*, SEQ ID NO:3 and SEQ ID NO:4, were not publicly available before the filing date of the earliest priority document.

None of the cited references, *i.e.*, Hamann *et al.* (B), Accession number P48960, or Campbell, teach or suggest a CD97 α subunit that comprises SEQ ID NO:3 or SEQ ID NO:4, and thus, cannot teach or disclose antibodies that bind to SEQ ID NO:3 or SEQ ID NO:4.

Hamann *et al.* (B) discloses the intron/exon organization of a CD97 gene that encodes three EGF like domains. See, *e.g.*, Figure 1 and caption at page 146 of Hamann *et al.* (B). The shortcomings of Accession number P48960 are discussed above and also demonstrate the failure of Accession number P48960 to provide a teaching or suggestion relevant to an obviousness rejection. Campbell discloses only techniques to make antibodies and does not teach or suggest SEQ ID NO:3 or SEQ ID NO:4 or antibodies that specifically bind to those sequences. Finally, Applicants were the first to identify soluble forms of the CD97 protein, *e.g,* the α1 and α2 subunits, and their role in angiogenesis and inflammatory processes. Without that knowledge and given the lack of disclosure of SEQ ID NO:3 and SEQ ID NO:4 in the cited references, the references also fail to provide a motivation for their combination to arrive at an antibody composition that comprises antibodies that specifically bind to SEQ ID NO:3 or SEQ ID NO:4.

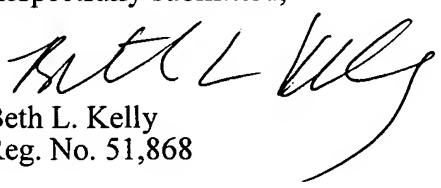
In view of the above amendments and remarks, withdrawal of the rejection under 35 U.S.C. §103(a) is requested.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



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Attachments
BLK:blk
60246889 v1

NCBI

Sequence Revision History

Revision history for P48960

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6226566	n/a	Oct 9 2000 11:03 AM	Dead	○	○
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6226566	n/a	Apr 10 2000 12:17 PM	Dead	○	○
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6226566	n/a	Jan 31 2000 9:08 PM	Dead	○	○
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Exhibit A

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Accession P48960 was first seen at NCBI on Jun 1 1996 2:58 AM

☐ 1: P48960[gi:1345711] This record was replaced or removed. See revision history for details.

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  AUTHORS   Hamann,J., Eichler,W., Hamann,D., Kerstens,H.M., Poddighe,P.J.,
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            This SWISS-PROT entry is copyright. It is produced through a
            collaboration between the Swiss Institute of Bioinformatics and
            the EMBL outstation - the European Bioinformatics Institute.
            The original entry is available from http://www.expasy.ch/sprot
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            and http://www.ebi.ac.uk/sprot
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☐ 1: P48960[gi:6226566] This record was replaced or removed. See revision history for details.

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DEFINITION  LEUCOCYTE ANTIGEN CD97 PRECURSOR.
ACCESSION   P48960
VERSION     P48960  GI:6226566
DBSOURCE    swissprot: locus CD97_HUMAN, accession P48960;
            class: standard.
            created: Feb 1, 1996.
            sequence updated: Dec 15, 1999.
            annotation updated: Dec 15, 1999.
            xrefs: gi: 840770, gi: 840771, gi: 1165073, gi: 4379069, gi:
            1165084, gi: 1165085, gi: 1165086, gi: 2660552, gi: 2660553, gi:
            1165087, gi: 4379070, gi: 1165089, gi: 1165090, gi: 1165091, gi:
            1165075, gi: 1165076, gi: 1165077, gi: 1165078, gi: 1165079, gi:
            1165080, gi: 1165081, gi: 1165082, gi: 1165083
            xrefs (non-sequence databases): HSSPP35555, GCRDBGCR_1063,
            GCRDBGCR_2113, GCRDBGCR_2382, MIM 601211, PROSITEPS00649,
            PROSITEPS00650, PROSITEPS00010, PROSITEPS01187, PFAMPF00002
KEYWORDS    G-protein coupled receptor; Transmembrane; Receptor; Glycoprotein;
            EGF-like domain; Repeat; Signal.
SOURCE      Homo sapiens (human)
  ORGANISM  Homo sapiens
            Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
            Eutheria; Primates; Catarrhini; Hominidae; Homo.
REFERENCE   1  (residues 1 to 835)
  AUTHORS   Hamann,J., Eichler,W., Hamann,D., Kerstens,H.M., Poddighe,P.J.,
            Hoovers,J.M., Hartmann,E., Strauss,M. and van Lier,R.A.
  TITLE     Expression cloning and chromosomal mapping of the leukocyte
            activation antigen CD97, a new seven-span transmembrane molecule of
            the secretion receptor superfamily with an unusual extracellular
            domain
  JOURNAL   J. Immunol. 155 (4), 1942-1950 (1995)
  MEDLINE   95363161
  REMARK    SEQUENCE FROM N.A.
REFERENCE   2  (residues 1 to 835)
  AUTHORS   Hamann,J., Hartmann,E. and van Lier,R.A.
  TITLE     Structure of the human CD97 gene: exon shuffling has generated a
            new type of seven-span transmembrane molecule related to the
            secretin receptor superfamily
  JOURNAL   Genomics 32 (1), 144-147 (1996)
  MEDLINE   96230339
  REMARK    SEQUENCE FROM N.A.
            TISSUE=FORESKIN
REFERENCE   3  (residues 1 to 835)
  AUTHORS   HAMANN,J.
  TITLE     Direct Submission
  JOURNAL   Submitted (~OCT-1997)
  REMARK    REVISIONS.
COMMENT     On Nov 4, 1999 this sequence version replaced gi:1345711.
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```

[FUNCTION] COULD BE A RECEPTOR POTENTIALLY INVOLVED IN BOTH
ADHESION AND SIGNALING PROCESSES EARLY AFTER LEUKOCYTE ACTIVATION.
[SUBCELLULAR LOCATION] INTEGRAL MEMBRANE PROTEIN.
[SIMILARITY] CONTAINS 5 EGF-LIKE DOMAINS.
[SIMILARITY] BELONGS TO FAMILY 2 OF G-PROTEIN COUPLED RECEPTORS.
[DATABASE] NAME=PROW; NOTE=CD guide CD97 entry;
WWW='http://www.ncbi.nlm.nih.gov/prow/cd/cd97.htm'.

FEATURES	Location/Qualifiers
source	1..835
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gene	1..835
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Protein	1..835
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Region	1..20
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Region	21..835
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Region	21..552
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      121 qqnprlcksy gtcvntlgsy tcqclpgfkf ipedpkvctd vnectsgqnp chssthclnn
      181 vgsyqcrcrp gwqpipgspn gpnntvcedv decssgqhqc dsstvcfntv gsyscrcrpg
      241 wkprhgipnn qkdtvcedmt fstwtpppgv hsqtlsrffd kvqdlgrdsk tssaevtiqn
      301 viklvdelme apgdvealap pvrhliatql lsnledimri lakslpkgpf tyispsntel
      361 tlmiqergdk nvtmgqssar mklnwavaag aedpgpavag ilsiqnmttl lanaslnlhs
      421 kkqaeleeiy essirgvqlr rlsavnsifl shnntkelns pilfafshle ssdgeagrdp
      481 pakdvmpgpr qellcafwks dsdrgghwat evcqvlgskn gsttcqcshl ssftilmahy
      541 dvedwkltli trvglalslf clllciltfl lvrpiqgsrt tihlhlcicl fvgstiflag
      601 ieneggqvgl rcrlvagllh ycflaafcwm sleglelyfl vvrvfqgqgl strwlcligy
      661 gvpllivgvs aaiyskgygr prycwldfeq gflwsflgpv tfiilcnavi fvttvwkltq
      721 kfseinpdmk klkkaralti taiaqlfllg ctwvfglfif ddrslvltyv ftilnclqga
      781 flyllhclln kkvreeyrkw aclvaggsky seftsttsgt ghnqtralra sesgi
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Align two sequences

Wed Jun 30 18:38:12 BST 2004

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 /usr/tmp/seq1.65400.sca :  742 aa
>September 24, 1999, 742 bases, E3080B0C checksum   742 aa vs.
>November 4; 1999, 835 bases, F87ED563 checksum.    835 aa
scoring matrix: , gap penalties: -12/-2
88.9% identity;         Global alignment score: 4887

               10        20        30        40        50        60
/usr/t MGGRVFLAFCVWLTLPGAETQDSRGCARWCPQNSSCVNATACRCNPGFSSFSEIITTPTE
       ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb MGGRVFLAFCVWLTLPGAETQDSRGCARWCPQNSSCVNATACRCNPGFSSFSEIITTPTE
               10        20        30        40        50        60

               70        80        90       100       110       120
/usr/t TCDDINECATPSKVSCGKFSDCWNTEGSYDCVCSPGYEPVSGAKTFKNESENTCQDVDEC
       ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb TCDDINECATPSKVSCGKFSDCWNTEGSYDCVCSPGYEPVSGAKTFKNESENTCQDVDEC
               70        80        90       100       110       120


/usr/t ------------------------------------------------------------

Novemb QQNPRLCKSYGTCVNTLGSYTCQCLPGFKFIPEDPKVCTDVNECTSGQNPCHSSTHCLNN
              130       140       150       160       170       180

                                                  130       140
/usr/t --------------------------------SSGQHQCDSSTVCFNTVGSYSCRCRPG
                                       ::::::::::::::::::::::::::
Novemb VGSYQCRCRPGWQPIPGSPNGPNNTVCEDVDECSSGQHQCDSSTVCFNTVGSYSCRCRPG
              190       200       210       220       230       240

       150       160       170       180       190       200
/usr/t WKPRHGIPNNQKDTVCEDMTFSTWTPPPGVHSQTLSRFFDKVQDLGRDSKTSSAEVTIQN
       ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb WKPRHGIPNNQKDTVCEDMTFSTWTPPPGVHSQTLSRFFDKVQDLGRDSKTSSAEVTIQN
              250       260       270       280       290       300

       210       220       230       240       250       260
/usr/t VIKLVDELMEAPGDVEALAPPVRHLIATQLLSNLEDIMRILAKSLPKGPFTYISPSNTEL
       ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb VIKLVDELMEAPGDVEALAPPVRHLIATQLLSNLEDIMRILAKSLPKGPFTYISPSNTEL
              310       320       330       340       350       360

       270       280       290       300       310       320
/usr/t TLMIQERGDKNVTMGQSSARMKLNWAVAAGAEDPGPAVAGILSIQNMTTLLANASLNLHS
       ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb TLMIQERGDKNVTMGQSSARMKLNWAVAAGAEDPGPAVAGILSIQNMTTLLANASLNLHS
              370       380       390       400       410       420

       330       340       350       360       370       380
/usr/t KKQAELEEIYESSIRGVQLRRLSAVNSIFLSHNNTKELNSPILFAFSHLESSDGEAGRDP
```

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                :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb KKQAELEEIYESSIRGVQLRRLSAVNSIFLSHNNTKELNSPILFAFSHLESSDGEAGRDP
                430       440       450       460       470       480

                390       400       410       420       430       440
/usr/t PAKDVMPGPRQELLCAFWKSDSDRGGHWATEVCQVLGSKNGSTTCQCSHLSSFTILMAHY
                :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb PAKDVMPGPRQELLCAFWKSDSDRGGHWATEVCQVLGSKNGSTTCQCSHLSSFTILMAHY
                490       500       510       520       530       540

                450       460       470       480       490       500
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                :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb DVEDWKLTLITRVGLALSLFCLLLCILTFLLVRPIQGSRTTIHLHLCICLFVGSTIFLAG
                550       560       570       580       590       600

                510       520       530       540       550       560
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                :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb IENEGGQVGLRCRLVAGLLHYCFLAAFCWMSLEGLELYFLVVRVFQGQGLSTRWLCLIGY
                610       620       630       640       650       660

                570       580       590       600       610       620
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                :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb GVPLLIVGVSAAIYSKGYGRPRYCWLDFEQGFLWSFLGPVTFIILCNAVIFVTTVWKLTQ
                670       680       690       700       710       720

                630       640       650       660       670       680
/usr/t KFSEINPDMKKLKKARALTITAIAQLFLLGCTWVFGLFIFDDRSLVLTYVFTILNCLQGA
                :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb KFSEINPDMKKLKKARALTITAIAQLFLLGCTWVFGLFIFDDRSLVLTYVFTILNCLQGA
                730       740       750       760       770       780

                690       700       710       720       730       740
/usr/t FLYLLHCLLNKKVREEYRKWACLVAGGSKYSEFTSTTSGTGHNQTRALRASESGI
                :::::::::::::::::::::::::::::::::::::::::::::::::::
Novemb FLYLLHCLLNKKVREEYRKWACLVAGGSKYSEFTSTTSGTGHNQTRALRASESGI
                790       800       810       820       830

Elapsed time:  0:00:00
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SBDS Align two sequences

Align two DNA or protein sequences using Lipman and Pearson's Align program

Enter (type or paste) your first sequence here, replacing the word *title* (after the >) with the name of your sequence. If your sequence is an EMBL or GenBank sequence as it appears in the data base delete the whole of the top line.

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>September 24, 1999
1 mggrvflafc vwltlpgaet qdsrgcarwc pqnsscvnat acrcnpgfss fseiittpte
       61 tcddinecat pskvscgkfs dcwntegsyd cvcspgyepv sgaktfknes
entcqdvdec
      121 ssgqhqcdss tvcfntvgsy scrcrpgwkp rhgipnnqkd tvcedmtfst
wtpppgvhsq
      181 tlsrffdkvq dlgrdsktss aevtiqnvik lvdelmeapg dvealappvr
hliatqllsn
      241 ledimrilak slpkgpftyi spsnteltlm iqergdknvt mgqssarmkl
nwavaagaed
      301 pgpavagils iqnmttllan aslnlhskkq aeleeiyess irgvqlrrls
avnsiflshn
      361 ntkelnspil fafshlessd geagrdppak dvmpgprqel lcafwksdsd
rgghwatevc
      421 qvlgskngst tcqcshlssf tilmahydve dwkltlitrv glalslfcll
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Enter (type or paste) your second sequence here, replacing the word *title* (after the >) with the name of your sequence. If your sequence is an EMBL or GenBank sequence as it appears in the data base delete the whole of the top line.

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>November 4, 1999
1 mggrvflafc vwltlpgaet qdsrgcarwc pqnsscvnat acrcnpgfss fseiittpte
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entcqdvdec
      121 qqnprlcksy gtcvntlgsy tcqclpgfkf ipedpkvctd vnectsgqnp
chssthclnn
      181 vgsyqcrcrp gwqpipgspn gpnntvcedv decssgqhqc dsstvcfntv
gsyscrcrpg
      241 wkprhgipnn qkdtvcedmt fstwtpppgv hsqtlsrffd kvqdlgrdsk
tssaevtiqn
      301 viklvdelme apgdvealap pvrhliatql lsnledimri lakslpkgpf
tyispsntel
      361 tlmiqergdk nvtmgqssar mklnwavaag aedpgpavag ilsiqnmttl
lanaslnlhs
      421 kkqaeleeiy essirgvqlr rlsavnsifl shnntkelns pilfafshle
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